Contribution ID: **5** Type: **not specified**

Octant of theta23 and NSI degeneracy at DUNE

Thursday 30 May 2019 16:00 (45 minutes)

We expound in detail the degeneracy between the octant of θ23 and flavor-changing neutral-current non-standard interactions (NSI's) in neutrino propagation, considering DUNE as a case study. In the presence of such NSI parameters involving the e – μ (εeμ) and e – τ (εeτ) flavors, the νμ ⟶ νe and νμ ⟶ νe bar appearance probabilities in long-baseline experiments acquire an additional interference term, which depends on one new dynamical CP-phase φ{eμ/eτ}. This term sums up with the well-known interference term related to the standard CP-phase δ creating a source of confusion in the determination of the octant of θ23. We show that for values of the NSI coupling (taken one at-a-time) as small as few % (relative to the Fermi coupling constant GF), and for unfavorable combinations of the two CP-phases δ and φ{eμ/eτ}, the discovery potential of the octant of θ23 gets completely lost.

Authors: Dr PALAZZO, Antonio (Bari University & INFN Bari); CHATTERJEE, Sabya Sachi (Institute for Particle Physics Phenomenology, Durham University); Dr AGARWALLA, Sanjib Kumar (Institute of Physics, Bhubaneswar)

Presenter: CHATTERJEE, Sabya Sachi (Institute for Particle Physics Phenomenology, Durham University)

Session Classification: Session 8